whether, if they are not so amended, the use of both is admissible for different groups. Some even go so far as to say that an obvious error in the spelling of a name, as, for example, *Rhinchosaurus* in place of *Rhynchosaurus*, should not be amended, and that the previous use of the incorrectly spelt name should be no bar to its subsequent employment for another group in the correct form. To many, at least, of those who have even the slightest knowledge of the classics such a practice must be repugnant. And to a certain extent, at any rate, the same remark will apply to hybrid names, although the general consensus of opinion is now against the amendment of these. Less objection can be taken to meaningless names, or anagrams (such as *Xotodon*, the anagram of *Toxodon*), which, if euphoniously formed, serve their purpose fairly well. And the old objection against so-called barbarous names has of late years been waived by many workers. Although it is by no means a general view, such names are more euphonious when Latinised, as *Linsanga* in place of *Linsang*, and *Coendua* for *Coendou*. Then again there are names like *Camelopardalis* (giraffe), *Hippotigris* (zebra), and *Hippocamelus* (a deer), given on the supposition that the animals to which they refer are intermediate between the two indicated by the compound title. The two former have late classical authority, and may further be justified on account of the coloration of the animals to which they refer, but to some persons, at least, the acceptation of the third is objectionable. It must be confessed, however, that when once individual fancy is allowed play in matters of this sort, it is difficult to know where to draw the line.

Another class of names are those which have been given to species on the evidence of maimed specimens, or examples whose place of locality was incorrectly recorded. The great bird-of-paradise was thus named *apoda*, while the name *ecaudatus* has similarly been applied to at least one mammal. Again, a bear inhabiting the Himalaya has been named *tibetanus*, while there are even more flagrant instances of misapplied geographical titles. Many workers of the modern school assert that no errors of this kind should be amended; while some would even say that although Tibet is the accepted modern way of spelling the country of the lamas, yet that if the specific title was originally spelt *thibetanus*, so it must remain for all time. A common-sense, rather than a pedantic, view can, we think, be the only safe guide in such cases. When a name inculcates an error in geographical distribution, its retention, from this point of view, is clearly indefensible. So, again, in the case of names due to misconception or maimed specimens. Where, for instance, the name *ecaudatus* denotes a long-tailed animal, its retention is against common sense. On the other hand, where the feet of a bird are inconspicuous, as in the swift, no great exception can be taken to the use of the name *apus*.

The last point in dispute to which we have space to refer is the right of an author to withdraw a name proposed by himself in favour of some later title. A well-known instance of this is afforded by the name *Daubentonia*, proposed by Geoffroy in 1795 for the aye-aye, but, on account of preoccupation in botany, subsequently withdrawn by him in favour of Cuvier's name *Chiromys* (or *Cheiromys*, as it was originally spelt). Whereas the right of withdrawal was denied by Gray (and the older name revived), by Sir William Flower it was admitted. The modern tendency is to follow Gray. If the preoccupation of a zoological name by a botanical were now admitted, of course Geoffroy's change would be followed. The question is whether, being right according to the views of his own time, there is sufficient justification for saying that he acted *ultra vires*. Moreover, the possibility is to be borne in mind that the next generation of zoologists will revert to the view that the use of a generic term in botany bars its subsequent employment in the sister science.

To arrive at a settlement in regard to these and many other points in dispute will require forbearance and the subordination of individual inclinations to the voice of the majority; compromise and common sense being, we venture to think, at least as necessary as adherence to inelastic rules.

In the foregoing we have purposely refrained from making any reference to Mr. H. M. Bernard's proposal to abolish specific names in those forms of life "which cannot be at once arranged in a natural system," for the reason that, if we understand him aright, it is his intention that the abolition in question should apply only (for the present, at any rate) to corals, sponges, and perhaps other low types of invertebrates. Whatever, therefore, may be its merits or demerits, the proposal is not yet intended to apply to such forms of life as are capable of being arranged in some approximation to a "natural system"; and the discussion of the disputable points in connection with specific names alluded to above is accordingly not yet rendered superfluous.

R. L.

CHARLES HERMITE.

AMONG those mathematicians who assisted in making the nineteenth century, and more especially the Victorian era, a period of unparalleled activity in the scientific world, the name of Charles Hermite will be indelibly imprinted in our annals as that of one who did much to develop the study of higher algebra, geometry, analysis and theory of functions.

Charles Hermite was born at Paris in 1822, and at the age of twenty he entered the École Polytechnique. His mathematical genius was not long in showing itself, for shortly afterwards we find him corresponding, at the instigation of Liouville, with Jacobi on the subject of Abelian functions, and the predictions of the latter mathematician that Hermite would soon extend the fields of study which he himself had done so much to open out was soon verified. From the theory of continuous functions Hermite soon passed on to the theory of forms, and gave a general solution of the problem of arithmetical equivalence of quadratic forms. He also discovered a new arithmetical demonstration of Sturm's and Cauchy's theorems on the separation of roots of algebraic equations.

The study of higher algebra, which sprang into existence with the discovery of invariants, was opened up simultaneously by Cayley, Sylvester and Hermite, and it would appear that to the latter mathematician we are indebted for the law of reciprocity, the discovery of associated covariants and gauche invariants, and the formation of the complete system of covariants of cubic and biquadratic forms and invariants of the quintic. Concurrently with these researches in arithmetic and algebra, Hermite was engaged on the study of the transformation of hyperelliptic functions and expansions of elliptic functions, and he was also the first to show that the number of non-equivalent classes of quadratic forms having integral coefficients and a given discriminant is finite. In 1856 Hermite was elected to the Institut, being then thirty-four years of age. In 1858 he took an important step in connection with the study of elliptic and theta functions by introducing a new variable connected with the q of Jacobi by the relation $q = e^{i\pi\omega}$, so that $\omega = ik'/k$. He was then led to consider the three modular functions denoted by $\phi(\omega)$, $\chi(\omega)$ and $\psi(\omega)$.

A transcendental solution of the quintic involving elliptic integrals was given by Hermite, the first paper appearing in the *Comptes rendus* for 1858 and subsequent papers in 1865 and 1866. After Hermite's first publication, Kronecker, in a letter to Hermite, gave a second solution, in which was obtained a simple resolvent of the sixth degree.

We are also indebted to Hermite for the first proof that *e*, the base of the Napierian logarithms, is transcendental, a result which paved the way for Lindemann's proof that the same is true of π.

In 1862 Hermite was elected to a newly founded chair at the École Normale, and later on he also became professor at the École Polytechnique and the Sorbonne. Instead of continuing to teach on the old lines which he found still in vogue, Hermite introduced into his lectures the great discoveries of Gauss, Abel, Jacobi and Cauchy. He thus founded for France a new school of higher geometry, and the large number of mathematicians of distinction who have studied under him bear abundant testimony to the success of his innovation.

During the later period of his life Hermite appears to have directed his attention more especially to questions connected with the calculus. In conjunction with Darboux and Jordan, he presented the general theory of linear differential equations in an entirely new light, choosing the algebraic rather than the geometric method of presentation. His work on Lamé's equation leads to the solution of a large number of problems in applied mathematics.

The "Cours de M. Hermite" constitutes an important work on the theory of functions.

About eleven years ago Hermite delivered an inaugural address before the President of the French Republic, which was published in the *Bulletin des Sciences mathématiques* for January 1890. In 1892 he celebrated his jubilee, and it is remarkable that the same year witnessed also the jubilee of Pasteur. The new century and the new era in history which has come upon our country will both be the poorer for the loss of M. Hermite, but his works will be handed down to posterity.

An account of his work has been given in the *Comptes rendus* for January 21 by M. C. Jordan, himself the author of important papers on the fields of study which Hermite had chosen to work in. To this account we are indebted for much matter contained in the present notice, and we are glad that M. Jordan pleads for the publication of Hermite's collected works. Many of his ideas are scattered in journals or letters that are difficult of access, and it will be of inestimable use to mathematicians to have them printed in book form. G. H. B.

ADOLPHE CHATIN.

ADOLPHE CHATIN died on January 13 at the age of eighty-seven. He was a native of Dauphiné, and was born at Ile-Marianne-de-Saint-Quentin, near Tullins, "d'une famille peu fortunée," according to M. Gaston Bonnier, from whose éloge in the *Comptes rendus* of the Paris Academy (January 21) some of the following facts of his life-history are taken. He received his early education at Tullins, and at seventeen joined an apothecary at Saint-Marcellin. Three years later (1833) he went to Paris under an apothecary named Briant, who, recognising his pupil's capabilities, urged him to study pure science as well as pharmacy. Chatin, who always gratefully remembered his good friend's advice and encouragement, worked to such effect that he took bachelors degrees both in Letters and Science, and six years after his arrival in Paris obtained the degree of Doctor of Science. In the next year, 1840, he read his thesis before the School of Pharmacy, and was duly admitted. The somewhat ambitious title of this thesis, "The Comparative Anatomy of Plants applied to Classification," indicated the line of work in which he has done most service to botany. It was a short paper dealing with the occurrence, structure and general properties of albumen in plant-seeds. He took the view that the presence of endosperm in the seeds, implying a temporary arrest in the embryogeny of the plant, indicates a lower condition than that existing in the exalbuminous seed. "From this time," he tells us in the introduction to the "Anatomie Comparée des Vegetaux," "comparative anatomy was (with plant symmetry) the principal object of my labours."

In 1844 he took the degree of Doctor of Medicine, and in 1848 was elected to the chair of Botany at the School of Pharmacy, his chief competitor being M. Payer. Twenty-five years later he became Director of the School, retiring in 1886 with the title of Honorary Director. In 1874 he was chosen a member of the Academy of Science, succeeding Claude Gay, and in 1897 became President of the Academy. He was also a member of the Academy of Medicine, and filled various other posts of honour.

His first memoir, published in 1837, was on the symmetry of structure of plant organs, and sixty years later appeared the last part of his studies on the symmetry of the vascular bundles of the petiole. His best-known work is the "Anatomie Comparée" (1856–1862), which was never completed. It consists of two parts, the larger illustrated by 113 plates, on Dicotyledonous Parasites, the smaller with 20 plates, on Aquatic Monocotyledons. It is difficult to estimate the value of this work. Its chief worth lies in the beautifully executed figures illustrating the anatomy of the stem, leaf and root of a large number of genera and species. Their preparation implies considerable skill and much hard, conscientious labour, with which the results, as embodied in the text of the book, are scarcely commensurate. But it is hard to judge the work of forty years ago from our present standpoint, and in helping to revive the study of plant-anatomy, which had fallen into neglect, Chatin did good service, and might well, in his later years, regard with some complaisance and pride its present important position as one of the factors in the evolution of a natural system of plant-classification.

Chatin also studied the organogeny of the flower, especially of the androecium, and collected the results of numerous small papers, which had previously appeared in the *Comptes rendus* and elsewhere, in a volume entitled "De l'Anthère" (1870)—a comparative account of the development, structure and mode of dehiscence of the anther in a number of families and genera. His memoir on the life-history and structure of *Vallisneria spiralis* is a useful piece of work, illustrated with characteristic elaborate detail. But he by no means restricted himself to the study of the symmetry and anatomy of plants; the subjects of his published works and papers comprise the results of chemical as well as botanical investigations. Among his earlier papers were several dealing with the occurrence of iodine in air and water, its presence in plant tissues and its effect on plant growth. He also wrote on the potato disease, the vine disease, and on the cultivation of truffles and other edible fungi, and published a small book on watercress.

For the past two years his health, hitherto robust, had been gradually failing, and his last days were spent in retirement at his country home at Essarts-le-Roi, near Rambouillet. His son, M. Joannes Chatin, a professor at the Sorbonne and a member of the Academy, has made a few contributions to botanical literature, but his work has been chiefly in other branches of science.

NOTES.

ARRANGEMENTS are being made by the Royal Academy of Sciences of Sweden to celebrate the third centenary of the death of Tycho Brahe, the founder of modern practical astronomy, on October 24, 1901, by a special meeting. It is also proposed to further commemorate Tycho's work by the publication of a facsimile of the original edition of his celebrated "Astronomiæ instauratæ mechanica," a perfect copy of which is in the library of the Academy. It is well-known that when at Wandesburg